

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

SITE PROFILE

December 1999

**Office of Oversight
Environment, Safety and Health
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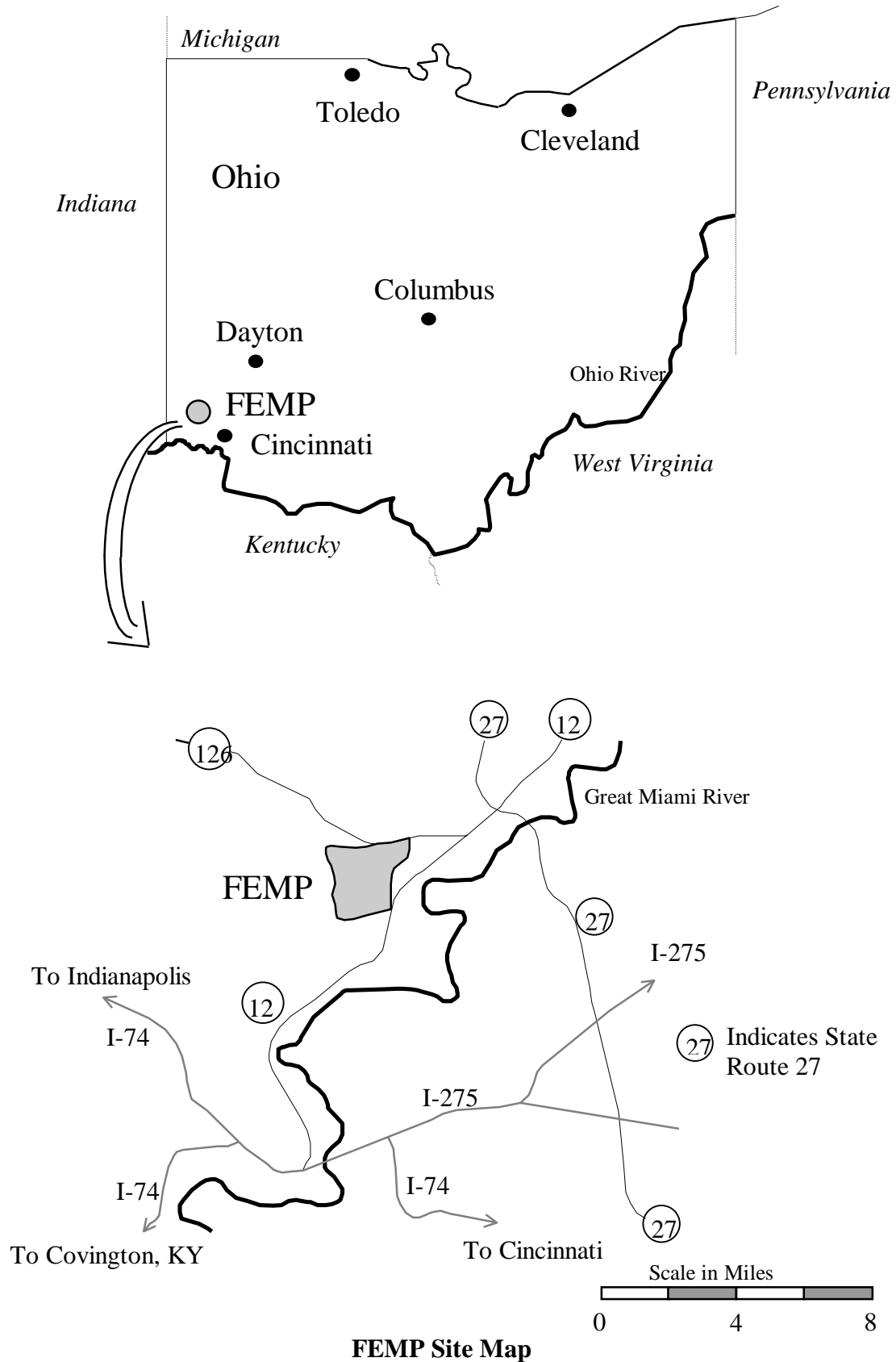
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Site profiles provide information on Department of Energy sites, including background; major environment, safety, and health initiatives and activities; items for management attention; and performance.

The electronic version of this site profile and other Office of Oversight documents referenced in this document can be accessed through the Internet at
<http://www.tis.eh.doe.gov/oversight/profiles/index.html>.

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

BACKGROUND

Description

The Fernald Environmental Management Project (FEMP) is located on a 1,050 acre-site in southwestern Ohio, approximately 18 miles northwest of Cincinnati.

The Fernald site was established in 1951 for the production of uranium metal, the first of which was produced in 1954. The site, formerly known as the Feed Materials Production Center (FMPC), produced highly purified uranium metal products that were used as feed materials in Department of Energy (DOE) production reactors to make plutonium and tritium. The production site consisted of a number of operations. Incoming and recycled material was received, sampled, and prepared in Plant 1. The refinery (Plant 2/3) converted this material into orange oxide (uranium trioxide - UO_3), which was converted into green salt (uranium tetrafluoride - UF_4) in Plant 4. Additionally, some incoming uranium hexafluoride (UF_6) was reduced to UF_4 in the Old Pilot Plant - Building 13. Plant 5 produced uranium metal by reduction of UF_4 . Uranium metal was then sent to Plant 6 (metal fabrication plant) for fabrication of billets and fuel cores. As a result of decreasing defense needs, DOE suspended production at Fernald in July 1989. Production was formally ended in 1991, and the site was renamed to reflect its new environmental restoration mission.

FEMP's primary cleanup plans include excavation, treatment, and offsite disposal of the site's most contaminated materials; excavation and onsite disposal of less-contaminated waste materials (primarily soil and demolition debris) in an engineered, onsite disposal facility; dismantling of buildings and other structures; dispositioning of the remaining uranium inventory and treatment

of contaminated groundwater. To facilitate cleanup, FEMP has been divided into five sections, known as operable units, based on their locations or the potential for similar technologies to be used in the ultimate cleanup. Operable Unit 1 includes waste pits 1 through 6, a burn pit, and a clear well. Operable Unit 2 includes the On Site Disposal Facility. The sanitary landfill, lime sludge ponds from water treatment activities, two fly ash piles from burning coal in the boiler plant, and South Field Area, which were previously Operable Unit 2 projects, were transferred to Operable Unit 5. Operable Unit 3 consists of the 136-acre former production area, including all former process buildings, structures, equipment, and inventoried hazardous materials. Operable Unit 4 includes the K-65 Silos (Silos 1 and 2), which contain radium-bearing wastes; Silo 3, which contains dried uranium-bearing wastes; and Silo 4, which is empty. Operable Unit 5 includes groundwater, surface water, soil, sediments, air, vegetation, and wildlife at and around the FEMP.

The operable units are described in Appendix A. Each operable unit's description includes its mission/status, hazard classification/ authorization basis, worst case design basis accident, and principal hazards and vulner-abilities.

Mission

The mission of FEMP is to remove or dispose of all site nuclear materials, carry out decontamination and decommissioning/ dismantlement (D&D) of all site buildings and facilities, and return as much of the site as possible to public use.

Management

The lead program secretarial office is the Office of the Assistant Secretary for Environmental Management (EM). Principal EM offices are shown in Table 1.

Table 1. Principal Headquarters Program Office Responsibilities for FEMP

Lead Program Secretarial Office - Office of the Assistant Secretary for Environmental Management (EM)
Principal EM Headquarters Offices
Office of Deputy Assistant Secretary for Environmental Restoration (EM-40)
Office of Eastern Area Programs (EM-42)
Environmental Restoration

Contractor activities are managed by the Ohio Environmental Management Project Office Field Office (OH) and DOE Fernald (DOE-FEMP), as shown in Table 2.

Table 2. Fernald Environmental Project Operating Contractors

DOE Ohio Field Office	
DOE Fernald Environmental Project Office	
Fluor Daniel Fernald, Inc. Teaming Partners	
Prime: Fluor Daniel, Inc., Haliburton NUS, Nuclear Fuels Services, and Jacobs Engineering	
Indiana Commercial Builders (Sub)	Sealing Plant 1 pad
Alliance (Sub)	Well drillers
Fred DeBra Company (Sub)	Advance wastewater treatment plant expansion south
R.E. Staver Group (Sub)	Slurry de-watering
B&J Electric (Sub)	Electrical (miscellaneous)
Foster Wheeler	Wastewater support/D&D of Boiler Plant
Petro Environmental Technologies, Inc. (Sub)	Construction of onsite disposal facility, excavation of southern waste units, site preparation
International Technology Corp. (Sub)	Operable Unit 1 - waste pit remediation
Wise Construction (Sub)	Construction labor hourly contractor
Rocky Mountain Remediation Services (Sub)	Silo 3 remediation
NSC Energy Services (Sub)	Plant 9 D&D, Maintenance Building tank farm D&D, Plant 6 D&D
MACTEC, Inc. (Sub)	Plant 5 D&D

Approximately 2,000 persons, including 55 Federal employees, work at FEMP. The contract with Fluor Daniel Fernald, Inc. (FDF) is a performance-based contract and has negative incentives for missing performance objectives and criteria or milestones. Effective November 30, 1997, DOE extended the FDF contract for an additional two years. The contract extension includes specific safety-related performance

criteria. In May 1998, DOE reviewed FDF's performance in specified areas and awarded FDF the third and final option year available under the existing contract. Therefore, the current prime contract expires on November 30, 2000. On August 5, 1999, the Secretary of Energy announced DOE's plan to re-compete the FEMP contract. The Secretary stated that competitive bidding challenges the incumbent contractor and

other bidders to bring forth their best ideas for innovation and efficiencies critical to achieving the goal of accelerated closure of the Fernald site by the end of 2006.

Budget

The information appearing in this section has been gathered from a number of sources and represents the best available budget information at the time of profile publication. This information is dynamic, depending on the point

in the budget cycle at which it is obtained. It is included to provide the reader with a sense of the magnitude and sources of the budget for this site. It is not intended to be the definitive source of budget information.

The FEMP site budget for fiscal year FY 1999 was approximately \$277 million, as shown in Table 3. The budget request for FY 2000 is approximately \$283 million.

Table 3. Major DOE Program Funding (In \$Thousands)

	FY 1999 Adjusted	FY 2000 Request
Office of Environmental Management (EM)	274,992	282,156
Office of Worker and Community Transition (WT)	1,000	1,000
Office of the Inspector General	616	331
Total	\$276,608	\$283,487

Source: FY 2000 Congressional Budget Request (2/1/99)

Significant Commitments to Stakeholders

Consent Agreement

Consistent with Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), DOE and the Environmental Protection Agency (EPA) signed a consent agreement in March 1990 establishing a framework and schedule for the remediation of the site.

Defense Nuclear Facilities Safety Board (DNFSB) Recommendations

There are no outstanding site-specific DNFSB recommendations for FEMP.

MAJOR ENVIRONMENT, SAFETY, AND HEALTH INITIATIVES/ACTIVITIES

Fluor Daniel Fernald Performance Enhancement Plan

On September 18, 1997, FDF initiated a Performance Enhancement Plan in response to a special clause in the new FDF contract requiring that FDF meet performance expectations defined by the plan or forgo the third year of the contract. The specific areas involved are: (1) management and control of nuclear materials; (2) management operations and accountability; (3) maintenance performance; and (4) quality assurance/quality control. In addition, the plan addresses cross-cutting safety and health performance issues, such as the performance of safety assessments and the implementation of integrated safety management.

Waste Management

An extensive site waste management program is active at FEMP for legacy wastes, components that are being deactivated and decontaminated, and newly generated secondary wastes (e.g., contaminated clothing). As of July 1999, Fernald shipments included 18,921 cubic feet of low level waste to the Nevada Test Site, 32,497 gallons of liquid mixed waste to the Toxic Substance Control Act Incinerator at DOE Oak Ridge, 737 metric tons uranium to DOE Oak Ridge Portsmouth, and 33,175 tons of material from the waste pits project to Envirocare of Utah, Inc. Another key waste management activity involves removing uranium products from the site. Progress to date includes: approximately 1.8 million pounds of uranium sold to the private sector, 4,800 fuel rods shipped to a fuel processor, and approximately three million pounds of materials that have been determined to no longer be considered "product."

Waste Pits Remedial Action Project

IT Corporation is performing the FEMP waste pits remedial action project under a fixed-price contract. The contract calls for IT to excavate, treat thermally (as required), stage, and load the material onto railcars for shipment to a permitted commercial disposal facility. A controlled, three-step process was developed for this project. The first step is the FLO (first load out) plan that uses stockpiled waste materials for initial load-out. The second step begins excavation of the pit materials that do not require thermal treatment to meet offsite disposal requirements. The third and final step begins excavation of pit materials that require thermal treatment. The total volume of material to be treated was estimated using data from the Operable Unit 1 remedial investigation/feasibility study. The waste pits program achieved major progress by meeting its enforceable agreement milestone by February 22, 1999, a week early. The second phase of the project was initiated on September 3, 1999, with the excavation of pit materials. The third phase of thermal treatment operations began in November 1999.

On Site Disposal Facility

One of the major waste management initiatives at the site approved by the U.S. EPA and the Ohio EPA, and endorsed by the Fernald Citizens Advisory Group, is the design and construction of the On Site Disposal Facility (OSDF). The OSDF project will reduce the quantity of offsite disposal of certain types of low-level radioactive wastes, such as facility demolition materials and secondary wastes. Since waste placement first began in Cell 1 in December 1997 and in Cell 2 in November 1998, approximately 275,000 cubic yards of contaminated soil and debris have been placed in the OSDF for final disposal as of August 1999. The construction of the liner of Cell 3 was initiated in June 1999. First waste placement in Cell 3 began in October 1999.

Silos 1 and 2/Silo 3

The Multi-Tech Proof-of-Principle phase of the project for Silos 1 and 2 was completed in June 1999. This phase of the project involved the testing of proven and commercially available stabilization technologies (vitrification and chemical stabilization). The results of this testing will support the revision of the Operable Unit 4 Feasibility Study/Proposed Plan. The draft Feasibility Study is being developed for DOE's review, and the Draft Feasibility Study/Proposed Plan is scheduled for submittal to EPA by February 1, 2000. Following EPA approval of the Feasibility Study/Proposed Plan, the Record of Decision Amendment is scheduled for submittal by December 28, 2000.

The Accelerated Waste Retrieval project involves retrieving material from Silos 1 and 2 and placing it in transfer tanks for temporary storage pending final treatment and offsite disposal. Foster Wheeler Environmental Corporation was awarded the contract on February 26, 1999.

The contract for the remediation of Silo 3 was awarded to Rocky Mountain Remediation Services, LLC (RMRS). Silo 3 contains approximately 5,100 cubic yards of cold metal oxides, which were generated at the site during uranium extraction operations in the 1950s. The

overall objectives of the Silo 3 project are the safe retrieval, stabilization/solidification, and offsite disposal of the present Silo 3 inventory. RMRS will be responsible for the design, construction, operation, retrieval, treatment, and shutdown and dismantlement of the treatment facilities.

Safe Shutdown/Decontamination and Dismantlement

Safe shutdown involves preparing facilities for dismantlement through the removal of uranium products and residue materials; removal of process equipment supplies and chemicals; and emptying, de-energizing, and isolating production-related equipment. In FY 1998, safe shutdown was completed on Plants 2, 3, and 8. As of March 1999, remaining shutdown activities were completed. This shutdown program is one of the first to be completed within the DOE complex.

After the completion of safe shutdown activities, a competitive bid process is used to award a fixed-price contract to conduct decontamination and dismantlement (D&D) of facilities or complexes. To date, Plant 1, Plant 7, Plant 4, High/Low Nitrate Tanks, Plant 1 Ore Silos, and the Old Sewage Treatment Plant have been successfully dismantled. In addition, D&D was completed on the Plant 9/Thorium Complex and the Boiler Plant/Water Plant Complex as of March 1999. Work continues on the D&D of the Maintenance/Tank Farm Complex and is ahead of the scheduled EPA completion date of March 2000. The D&D subcontractor for the Plant 5 Complex has completed mobilization activities and begun demolition work. In September 1999, the subcontract was awarded for the D&D of the Plant 6 Complex, and the Notice to Proceed has been issued.

Construction Activities

Phase II construction on the OSDF has been continuing since June 1998 and has involved the placement of contaminated soil and debris in Cell 1 and Cell 2. Construction of the Cell 3 liner

system started in June 1999. Cell 2 began first waste placement in November 1998, and was followed by Cell 3 in October 1999. Phase I of the OSDF, completed in December 1997, consisted of the construction of the first cell in the eight-cell facility. The OSDF is designed to contain 2.5 million cubic yards of soil and debris from the site. The OSDF will be approximately 3,700 feet by 800 feet, with a maximum height of 64 feet. A multi-layer cap and liner system with both natural and synthetic components is being used to protect the underlying Great Miami Aquifer. The cap and liner system incorporates a leachate collection system, a leak detection system, and a leachate transmission system. This system, which carries the leachate from Cell 1 and Cell 2 to the Advanced Wastewater Treatment Facility for treatment, is critical to the ultimate success of the OSDF project.

ENVIRONMENT, SAFETY, AND HEALTH ITEMS FOR MANAGEMENT ATTENTION

During the period April to May 1996, the Office of Oversight conducted an independent oversight evaluation of environment, safety and health (ES&H) programs at FEMP. The evaluation concluded that the safety management program at FEMP was effective, but that increased attention was needed to address the items discussed below. In September 1998, the Office of Oversight conducted a follow-up review of the status of corrective actions from the 1996 evaluation. The results of the follow-up review were used in updating the following discussions. Information from the DOE Corrective Action Tracking System (CATS) database was used to update the action status of the FEMP items that are contained in the database. More detailed information on these corrective actions is accessible at <http://tis.eh.doe.gov/portal/catsentry.html>

DOE-FEMP Oversight

The 1996 Office of Oversight evaluation identified that the DOE-FEMP assessment

program intended to ensure contractor compliance with ES&H requirements was not being implemented in accordance with the Fernald Technical Management Plan (TMP) and site procedures. Weaknesses involved oversight activities performed by Facility Representatives, subject matter experts, and management and staff who conduct walk-throughs.

Action Status

As of August 26, 1999, FEMP reported in the CATS database that the two corrective actions for this issue had been completed and verified.

FDF Maintenance Work Control

The 1996 Office of Oversight evaluation identified that, within FDF, the conduct of work as it relates to maintenance was ineffective. Identified weaknesses included: the lack of an effective maintenance management program, ineffective use of resources, procedural non-compliance, implementation of unapproved work processes, ineffective preventive maintenance program, and ineffective processes for estimating, prioritizing, scheduling, and executing maintenance activities.

Action Status

As of August 27, 1999, FEMP reported in the CATS database that all 22 corrective actions for this issue had been completed and verified.

Electrical Safety Program

The 1996 Office of Oversight evaluation noted deficiencies in some electrical safety program elements. Weaknesses involved failure to follow or implement required procedures, ineffective corrective action program elements, lack of approved procedures, and lack of electrical preventive maintenance.

Action Status

As of August 27, 1999, FEMP reported in the CATS database that all six corrective actions for this issue had been completed and verified.

Tracking and Trending of Corrective Actions

The 1996 Office of Oversight evaluation found that within DOE-FEMP and FDF, corrective actions from various programs and organizational lines were not tracked or trended, and often did not address root causes or extent of conditions. Effective controls to prevent recurrence had not been implemented, and management was not held accountable.

Action Status

As of November 2, 1999, FEMP reported in the CATS database that all ten corrective actions for this issue had been completed and verified.

Roles, Responsibilities, and Authorities

The 1996 Office of Oversight evaluation identified weaknesses in the definition of roles, responsibilities, and authorities within OH and DOE-FEMP. Specifically, OH responsibilities were not well defined, and DOE-FEMP responsibilities for implementing all requirements in the Technical Management Plan (TMP) were not clearly communicated. Weaknesses in roles and responsibilities contributed to contractors not operating in accordance with safety analyses, and bases for interim operations (BIOs) not adequately reviewed and approved by DOE.

Action Status

As of November 2, 1999, FEMP reported in the CATS database that the two corrective actions for this issue had been completed and verified.

Conduct of Radiological Work

The September 1998 Oversight follow-up review found that the conduct of radiological operations in the field and the clarity and

consistency of radiological work permits (RWPs) used by FDF to delineate radiological requirements were in need of improvement. Deficiencies in radiological conduct of operations included boundary control violations, lack of survey documentation, procedural informality, and inadequate radiological housekeeping. There was no mechanism to ensure that work packages with standing and conditional RWPs were updated to reflect job history, radiological reviews, and special precautions. RWP forms were sometimes completed with ambiguities and inconsistencies, lacked survey data, or had legibility problems.

Action Status

As of August 26, 1999, FEMP reported in the CATS database that five of the six corrective actions for this issue had been completed and verified. The one outstanding action is to assess radiological control conduct of operations to validate improvements made in field operations. This assessment is scheduled to be completed by December 30, 1999.

Nuclear Materials Management

The management of low-enriched uranium requiring specific nuclear criticality control measures continues to present a significant vulnerability at FEMP. FEMP site management continues to experience operational events involving the improper maintenance and control of these nuclear materials. Although FEMP no longer produces uranium metal, it stores a total of about 11.4 million pounds of uranium in various forms.

Action Status

As a result of the a number of operational incidents, the FDF President and General Manager suspended all operations associated with enriched uranium requiring specific nuclear criticality control measures on July 3, 1997. DOE-FEMP also directed that an operational readiness review (ORR) be planned, coordinated, and executed prior to startup of any activities

associated with enriched uranium materials work. The FDF ORR began on March 2, 1998, and was completed on March 17, 1998. The DOE ORR, conducted April 14-18, 1998, identified four pre-start findings, primarily involving documentation. The findings were resolved, and on May 20, 1998, re-start was authorized.

In July 1998, recurring operational problems were experienced in the 4B Warehouse. In August 1998, an FDF team conducted a self-assessment of this incident. The FDF team determined that the root cause of the event was that operations personnel at several levels did not follow procedures and did not demonstrate an adequate commitment to performing work in a disciplined manner, especially in the areas of responsibility, accountability, enforcement, and adequate oversight. Thirteen judgments of need were issued. A corrective action plan was developed, and the corrective actions were implemented. During December 1998, a readiness assessment was conducted by FDF, with oversight by a six-person DOE team. The readiness assessment identified eleven pre-start findings, including issues concerning safety, procedural adequacy, procedural compliance, and training. The correction of these pre-start issues was completed and verified by January 11, 1999. The handling of enriched, restricted material resumed, and, to date, no significant problems have occurred. As of August 1999, a total of 737 metric tons uranium of nuclear product and materials has been shipped to the DOE Oak Ridge Portsmouth site.

RECENT SITE PERFORMANCE

Major Events

Gantry Crane Collapse Resulting in Worker Injury

On January 14, 1999, an FDF instrument mechanic was moving calibration weights in the scale shop with a 2000-pound capacity gantry crane. After disconnecting a 500-pound calibration weight, the mechanic attempted to

reposition the gantry crane when it collapsed. One of the leg braces apparently became disconnected, causing the crane to collapse onto the mechanic. The mechanic was able to pull himself clear of the crane and alert another employee. The FEMP emergency response team transported the injured worker to a local hospital, where he was treated for fractures to the right fibula and ankle, ligament damage, and minor lacerations. The accident scene was secured and an investigation was begun. No other gantry cranes of this type are in service at FEMP, but FDF management directed an inspection of all other gantry cranes prior to continued operation.

Leak in the OSDF Leachate Transmission System

After a leak was discovered in the OSDF Leachate Transmission System, the Leachate Management Contingency Plan was implemented, and the leachate generated from Cells 1 and 2 was transferred to the Advanced Waste Water Treatment Facility by tanker truck. In addition, robotic camera crews were used to inspect the leachate line. The OSDF Leachate Conveyance System Leak Investigation Report, which identified two probable failure modes for the leachate line, was transmitted to U.S. EPA and Ohio EPA in April 1999. The probable cause identified was the improper installation of electrofusion couplings due to inadequate surface preparation of the pipe in the coupling. The interim Leachate Transmission System was placed into operation in May 1999, so that waste placement could proceed during construction season. The permanent Leachate Transmission System is under design and is scheduled to be installed in phases until completion in December 2001. Waste placement in Cell 2 of the OSDF resumed in June 1999 and waste placement in Cell 1 resumed in July 1999.

Thorium Metal Fire at Building 65

On July 24, 1999, a fire started inside a five-gallon container of thorium metal located in the middle bay of Building 65, as it was being vented by puncturing the lid. After the lid of the

specified can was punctured, a bright, white flash occurred inside the can and was recorded on video. Approximately eight seconds after the flash occurred, white smoke began to rise from the hole in the can. A Met-L-X fire extinguisher was used to spray agent into the hole in the can's lid. Then smoke appeared from another can, and the nylon netting and strap around the cans began to burn. Personnel were evacuated from the building as the supervisor used two Class D extinguishers on the cans and netting and strap. Emergency response team personnel put the two cans into a 30-gallon drum filled with water to reduce the heat of the cans. The work crew was monitored for contamination, and radiological surveys of the exit path were taken to ensure that no contamination had spread. There was no release of airborne radioactivity detected from the building, no spread of contamination, and no injuries to or contamination of personnel involved in the incident.

Results of Major Recent Assessments

DOE-FEMP Oversight Assessments

Over the last six months, DOE-FEMP has conducted approximately eight formal assessments of contractor activities. These have included rail transportation, the employee concerns program, the DOE-FEMP Facility Representative program, the DOE-FEMP Action Tracking System, and 10 CFR 835 compliance.

Areas identified as needing improvement included radiological training and qualifications, and integrated safety management system (ISMS) documentation and procedures.

Office of Oversight Follow-up Review

On September 14-23, 1998, the Office of Oversight conducted a follow-up review of the 1996 independent oversight evaluation of ES&H programs at FEMP. The review was conducted to determine the status of corrective actions taken to address selected issues and concerns identified during the 1996 evaluation. The areas reviewed included definition and implementation of roles

and responsibilities for DOE personnel; programs for assessing performance and implementing corrective actions; work planning and control; maintenance; electrical safety; and radiation protection. Both DOE and FDF were evaluated. Details of this review are contained in the report *Follow-up Review of the 1996 Integrated Safety Management Evaluation at the Fernald Environmental Management Project* (October 1998).

ISMS Verification Review

OH conducted a review of FEMP's Phase I and Phase II ISMS April 12-23, 1999, to validate

compliance with the Secretary's integrated safety management (ISM) directive. OH issued the *Fernald Environmental Management Project Integrated Safety Management System Verification Report* (April 1999) on May 14, 1999. The report documented three deficiencies and twelve areas for improvement. Corrective actions were completed in July 1999, and a joint FDF/DOE-FEMP ISMS assessment was also conducted during July 1999. This assessment identified two deficiencies and fifteen areas for improvement. It is anticipated that the OH ISMS team will return by the end of 1999 to complete the validation of FEMP's ISMS implementation.

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Appendix A. Operable Unit Summary*

AREA NAME	MISSION/ STATUS	HAZARD CLASSIFICATION/ AUTHORIZATION BASIS	WORST CASE DESIGN BASIS ACCIDENT	PRINCIPAL HAZARDS AND VULNERABILITIES
OU-1: On- Property Waste Storage Area	Mission: Offsite disposal of wastes and restoration of area in OU-1 Status: Operational	Less than Category 3 with no required safety documentation other than initial hazard screening analysis.	No significant design basis accident scenario is associated with this operable unit (OU).	Hazards: Normal, depleted and enriched uranium; thorium; other radioactive material such as radium/radon; chemicals; wastes; magnesium fluoride (MgF) reduction furnace slag; slag leach filter cake; neutralized raffinate; depleted sump cake; general sump sludge; dust collector residue; other wastes generated in the production area; standard industrial hazards; falls; asbestos; lead; and water and soil contamination. Vulnerabilities: Worker exposure to radioactive or contaminated materials and contamination of the aquifer. (Emergency plans emphasize command and control of an over-the-road waste shipment accident between FEMP and the designated disposal facility.)
OU-2: On-Property Disposal Facilities	Mission: Onsite disposal of flyash, lime sludge, and solid waste landfill and some offsite disposal of wastes Status: Operational	Less than Category 3 with no required safety documentation other than initial hazard screening analysis	No significant design basis accident scenario is associated with this OU.	Hazards: Standard industrial and construction.

*As a result of the Phase II Replan, DOE-FEMP has projectized the FEMP site and transitioned from operable units to projects.

Appendix A. Operable Unit Summary (cont'd)*

AREA NAME	MISSION/ STATUS	HAZARD CLASSIFICATION/ AUTHORIZATION BASIS	WORST CASE DESIGN BASIS ACCIDENT	PRINCIPAL HAZARDS AND VULNERABILITIES
OU-3: Former production facilities and special projects	Mission: Decontamin-ation and demolition of nine production plants Status: Operational	Plant 1 Pad : Category 2 -basis for interim operations (BIO) ** Plant 2/3: Radiological Facility, ASR*** Plant 4: Category 2 BIO** Plant 5: Radiological Facility, ASR*** Plant 6: Radiological Facility, ASR*** Plant 8: Radiological Facility, ASR*** Bldg 77: Category 2 –BIO Old Pilot Plant: Radiological Facility, ASR Quonset Huts: Category 3 BIO Thorium Warehouses: Category 3 BIO ** Plants 1 and 4 proper have been demolished. *** Materials have been removed, reducing the hazard category; revised BIO approved May 1999.	Potential nuclear criticality event due to enriched uranium inventories. Loss of confinement.	Hazards: Normal, depleted and enriched uranium; thorium; other radioactive material such as radium/radon; chemicals; wastes; magnesium fluoride (MgF) reduction furnace slag; slag leach filter cake; neutralized raffinate; depleted sump cake; general sump sludge; dust collector residue; other wastes generated in the production area; standard industrial hazards; falls; asbestos; lead; and water and soil contamination. Vulnerabilities: Worker exposure to radioactive or contaminated materials and contamination of the aquifer. (Emergency plans emphasize command and control of an over-the-road waste shipment accident between FEMP and the designated disposal facility.)
OU-4: Four concrete silos, silo contents, earth berm, and decant sump	Mission: Remedial design Status: Design phase	Category 3; safety basis documentation includes a hazard analysis report (HAR) and BIO	Significant radium content, radon release.	Hazards: Substantial quantities of radioactive (radium) and toxic chemicals. Vulnerability: Potential exposure of workers, the public, and the environment.
OU-5: Groundwater surface water, and soils not associated with other operations; Advanced Waste Water Treatment plant	Mission: Treatment of contaminated ground and surface water Status: Operational	Below Category 3; radiological facility, ASR	No significant design basis accident scenario is associated with this OU.	Hazards: Standard industrial/chemical. Vulnerabilities: Worker exposure to chemicals.

*As a result of the Phase II Replan, DOE-FEMP has projectized the FEMP site and transitioned from operable units to projects.